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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,456	10/31/2006	Marcus Brian Mayhall Fenton	C049105/0225761	8485

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BRYAN CAVE LLP  
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EXAMINER
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CERNOCH, STEVEN MICHAEL

ART UNIT	PAPER NUMBER
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3752

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12/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,456	<b>Applicant(s)</b> FENTON ET AL.	
	<b>Examiner</b> STEVEN CERNOCH	<b>Art Unit</b> 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 13, 25-28 and 31-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-24, 29, 30 and 52-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the closed mixing chamber must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-12, 14-20, 23, 30 and 52-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams et al. (US Pat No 5,779,159).

Re claim 1, Williams et al. shows an apparatus for generating a mist (Fig. 1, N) comprising: a conduit having an exit (B); a transport nozzle (O) in fluid communication with the conduit, the transport nozzle being adapted to introduce a transport fluid; a working nozzle (PO) positioned adjacent to the transport nozzle, the working nozzle being adapted to spray introduce a working fluid; wherein the transport nozzle includes a convergent-divergent portion (S) therein wherein the transport nozzle has an inner surface and an outer surface, each being substantially frustoconical in shape; and

wherein the transport nozzle is shaped such that the transport fluid introduced from the transport nozzle has a divergent flow pattern (O).

Re claim 2, Williams et al. shows wherein the working nozzle substantially circumscribes the conduit (Fig. 1, PO).

Re claim 4, Williams et al. shows wherein the conduit comprises a mixing chamber (Fig. 1, nearest N), wherein the transport nozzle (O) is adapted to introduce the transport fluid into the mixing chamber and the working nozzle (PO) is adapted to introduce the working fluid into the mixing chamber.

Re claim 5, Williams et al. shows wherein the mixing chamber includes a diverging portion (Fig. 1, S).

Re claim 6, Williams et al. shows wherein the transport (Fig. 1, O) and working nozzles (PO) have a relative angular orientation such that in use the working fluid is atomized and a dispersed droplet flow regime of droplets having a substantially uniform size is created by the introduction of transport fluid flow from the transport nozzle into working fluid flow from the working nozzle and the subsequent shearing of the working fluid by the transport fluid.

Re claim 7, Williams et al. shows wherein the working nozzle (Fig. 1, PO) is intermediate the transport nozzle (O) and the exit (nearest N).

Re claim 8, Williams et al. shows wherein the inner surface of the transport nozzle (Fig. 1, O) is formed by an outer surface of a protrusion (S), wherein the protrusion is disposed within the conduit (B).

Re claim 9, Williams et al. shows wherein the apparatus includes a transport plenum (PM) arranged inside the conduit (B) and proximal to the transport nozzle (O).

Re claim 10, Williams et al. shows wherein the transport plenum (Fig. 1, PM) and the transport nozzle (O) are arranged axially (W) in the apparatus.

Re claim 11, Williams et al. shows further comprising a transport fluid inlet (Fig. 1, I) wherein the transport fluid inlet, transport plenum, and the transport nozzle are arranged axially (W) in the apparatus.

Re claim 12, Williams et al. shows wherein the transport nozzle (Fig. 1, O) is shaped with a convergent-divergent profile (S) to provide supersonic flow of the transport fluid which flows there through.

Re claim 14, Williams et al. shows a working fluid plenum (Fig. 1, P) that substantially circumscribes the conduit.

Re claim 15, Williams et al. shows wherein the working nozzle (Fig. 1, PO) is shaped such that working fluid introduced from the working nozzle has a convergent flow pattern.

Re claim 16, Williams et al. shows wherein the working nozzle (Fig. 1, PO) has inner and outer surfaces each being substantially frustoconical in shape.

Re claim 17, Williams et al. shows wherein the working nozzle (Fig. 1, PO) substantially circumscribes (P) the transport nozzle (O).

Re claim 18, Williams et al. shows the working fluid plenum (Fig. 1, P) substantially circumscribes the transport nozzle (O).

Re claim 19, Williams et al. shows wherein the working nozzle (Fig. 1, PO) substantially circumscribes (P) the protrusion (S).

Re claim 20, Williams et al. shows the working fluid plenum (Fig. 1, P) substantially circumscribes the protrusion (S).

Re claim 23, Williams et al. shows wherein the mixing chamber is closed upstream of the transport nozzle (Fig 1, N).

Re claim 30, Williams et al. shows to spray water droplets on the fire (abstract).

Re claim 52, Williams et al. shows an apparatus for generating a mist (Fig. 1, N) comprising: a housing (B) having a plurality of interior walls, at least one of the plurality of interior walls defining a passageway (28) along a longitudinal center axis, the passageway having an inlet (I), a plenum (PM) adjacent to the inlet, and a portion (18) adjacent to the plenum, the at least one of the plurality of interior walls being tapered outwardly with respect to the axis along the portion; a protrusion (S) with a solid interior located proximate the portion, the protrusion having an outer surface tapered outwardly with respect to the axis; a transport nozzle (O) defined between: the at least one of the plurality of interior walls tapered outwardly with respect to the axis along the portion, and the outer surface tapered outwardly of the protrusion; a working nozzle (PO) being defined by other of the plurality of interior walls of the housing, the working nozzle being coincident the transport nozzle so that a working fluid communicated to the working nozzle mixes (column 1, lines 34-37) with a transport fluid exiting the transport nozzle; and a working fluid inlet (22) disposed along the housing in communication with the working nozzle.

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Re claim 53, Williams et al. shows a chamber (Fig. 1, nearest N) adjacent the portion wherein the transport nozzle exits into the chamber and the working nozzle exits into the chamber so that the working fluid communicated to the working nozzle mixes in the chamber with the transport fluid exiting the transport nozzle.

Re claim 54, Williams et al. shows an apparatus for generating a mist (Fig. 1, N) comprising: a first fluid passage (P) having a first fluid inlet (22) and a first fluid outlet (PO); the first fluid passage defining a working nozzle (O) with a convergent flow pattern; a second fluid passage (W) having a second fluid inlet (I) and a second fluid outlet (O); a protrusion (S) located in the second fluid passage to define a transport nozzle (O) with inner and outer surfaces substantially frustroconical in shape and having a divergent flow pattern.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US Pat No 5,779,159).

Re claims 22 and 24, Williams et al. discloses the claimed invention except for an included angle of 6 or 12 degrees. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include an angle of 6 or 12 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 3, 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US Pat No 5,779,159) as applied to claim 1 above, and further in view of Pennamen et al. (5,810,252).

Re claim 3, Williams et al. does not show wherein an angular orientation and internal geometry of the transport and working nozzles are such that a substantial portion of the working fluid droplets have a size that is less than 50  $\mu\text{m}$ .

However, Pennamen et al. does teach droplets of less than 50  $\mu\text{m}$  (abstract, lines 1-4).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the droplets of Williams et al. with the size of Pennamen et al. to utilize a fine droplet size (abstract).

Re claim 21, Williams et al. does not show wherein the internal geometry of the transport nozzles has an exit area to throat area ratio, in the range of 1.75 to 15.

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However, Pennamen et al. does teach wherein the internal geometry of the transport nozzles has an exit area to throat area ratio, in the range of 1.75 to 15 (column 2, lines 61-63).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the channels of Williams et al. with the ratio of Pennamen et al. to ensure an atomization orifice (column 2, lines 52-56).

Re claim 29, Williams et al. does show where the working fluid is water (column 3, lines 7-11).

Williams et al. does not teach steam.

However, Pennamen et al. does teach steam (column 2, lines 64-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the motivation to modify the fluid of Williams et al. with the steam of Pennamen et al. to aide in atomization (52-55).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN CERNOCH whose telephone number is (571)270-3540. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. C./

Examiner, Art Unit 3752

/Len Tran/

Supervisory Patent Examiner, Art Unit 3752